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oblonpat@oblon.com
jgardner@oblon.com

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3 RECORD OF ORAL HEARING
4 UNITED STATES PATENT AND TRADEMARK OFFICE
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6
7 BEFORE THE BOARD OF PATENT APPEALS
8 AND INTERFERENCES
9

10 Ex parte FRANCOIS KUBICA
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13 Appeal 2008-438
14 Application 10/716,461
15 Technology Center 3600
16

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18 Oral Hearing Held: July 9, 2008
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22 Before WILLIAM F. PATE, III, JENNIFER D. BAHR, and
23 JOHN C. KERINS, Administrative Patent Judges
24

25
26 ON BEHALF OF THE APPELLANT:
27

28 EDWARD W. TRACEY JR.
29 Oblon, Spivak, McClelland, Maier & Neustad
30 1940 Duke Street
31 Alexandria, VA 22314
32
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35 The above-entitled matter came on for hearing on July 9, 2008, commencing
36 at 9:07 a.m. at the U.S. Patent and Trademark Office, 600 Dulany Street,
37 Alexandria, Virginia.

PROCEEDINGS

JUDGE PATE: Mr. Tracy. Good morning to you.

EDWARD TRACY: Good Morning.

JUDGE PATE: I'll let you get set up there. We've had time to go over this case before hand and we're pretty familiar with the issues and we're ready to hear your arguments for patentability.

EDWARD TRACY: OK great. OK in general I'd like to start by discussing the art in general and I think that's really where the issues I think in this case are, as far as claim 1 and even to claims 9 – 11, which will be argued separately. In general in the control of a missile or aircraft as described in the Internet section that I provided, you get the position of the aircraft. You then decide, you then get some kind of feedback as to where you are going. So for example with a missile, it would be a target position. You would then determine a desired path to go, and then that would go into a guidance algorithm. And the guidance algorithm would output the command that you need to get to that position. And then that command goes into an autopilot, which creates actuator commands to move control surfaces to get there. Now in the present invention, it's been determined in the past to separate guidance and autopilot into two different computers. That has led to some redundancies as described in the background. What the present invention does is it has guidance and autopilot on two separate computers, and then a dedicated link between them. So for example in a missile it is very critical that as soon as you get feedback as to where the target is, you then need to get commands to the actuator as fast as possible, to continue tracking. So that critical path calculations have to go as quickly as possible.

1 This of course is an aircraft and you get positions from a pilot, but even with
2 a pilot in automatic mode the position of the aircraft that is received from an
3 inertial sensor gets stale. So the longer you wait, those commands become
4 obsolete. So the critical path calculations are, must be done as fast as
5 possible to keep that from happening. And thus the present invention has
6 that dedicated link to provide those commands as quickly as possible. The
7 issue, or if I go to the art, Pages describes a computer where the PA 13
8 automatic pilot device 13, receives from computer 12 position in route of the
9 next point to be reached. Which is again the input to a guidance algorithm.
10 It then does both the guidance and the autopilot in that computer and sends,
11 as described it sends out commands to the actuators. So it doesn't divide the
12 way the present invention does, or the way the claimed invention does, and it
13 doesn't again have that link because it's all in the same computer. The issue
14 for claim 1 was the examiner was stating that the autopilot commands was
15 too broad or the exact, automatic pilot instructions was too broad and
16 therefore it read the sort of the line of sight elements that are being sent from
17 computer 12 to computer 13. Again it's our position that one skilled in the
18 art would know that the line of sight never could be the automatic pilot
19 instruction or the guidance commands. Those are simply an input to a
20 guidance algorithm again and not an output. And I believe in the examiners
21 answer, it stated that there was no definitions of that, or the only definition
22 was at the top of page 2, however as discussed in our reply brief later on, we
23 specifically define the automatic pilot instructions to include commanded
24 roll, commanded load factor and commanded yaw. And those are clearly
25 known in the art to be guidance commands. Unless, any argument that the

claims 9 – 11 are too vague I think is rebutted by the fact that those are clearly known in the art.

JUDGE BAHR: I don't think the examiners saying the claims are too vague, I think the examiners just saying that term is broad, and broad enough to be met by what computer 12 outputs. Computer 12 definitely computes something so what it's computing is definitely an output to some algorithm. I don't it's fair to say that it's an input to an algorithm and not an output to an algorithm, because it's clearly an output to some computation.

EDWARD TRACY: Right, but to what is known in the art as a guidance algorithm the output of computer 12 is sort of the line of sight or the position or the desired position which is an input to a guidance algorithm. And that's what's sent to computer 13, or automatic pilot device 13. But especially with regard to claims 9 through 11 you know the line of sight is very different from a commanded yaw or roll rate or load factor. The response to that was simply that, that's just not a way of doing it. However...

JUDGE BAHR: But those are dependant claims 9 through 11.

EDWARD TRACY: Correct, we've argued them separately.

JUDGE BAHR: So isn't claim one broader than that?

EDWARD TRACY: Yes. There's different ways I think you could... the reason we didn't immediately collapse that into claim 1, for example in missiles it's commanded yaw, pitch and roll. All three angles are the typical guidance commands. Where in a plane I think it's typically the load factor, the yaw and the roll are guidance commands.

JUDGE PATE: Did you have any other arguments?

EDWARD TRACY: No. I think that addresses all the main issues.

1 JUDGE PATE: Do you want to ask about the spec?

2 JUDGE BAHR: I was a little confused about something on page, the
3 paragraph bridging pages 1 and 2 of the specification.

4 EDWARD TRACY: OK

5 JUDGE BAHR: It looks to me like that first sentence that starts on
6 page 1, "the navigation computer receives guidance instructions and
7 guidance parameters and from these guidance instructions and parameters
8 produces automatic pilot instructions."

9 EDWARD TRACY: Right.

10 JUDGE BAHR: So it's known to have a computer that does that, and
11 then "the control computer converts these automatic pilot instructions into
12 commands for operating the automatic pilot." That sounds like what's going
13 on in claim 1.

14 EDWARD TRACY: It doesn't have dedicated... for example that
15 describes what happens in figure 1. Well figures 1 and 2. That 9a receives
16 the guidance instructions from 10 and then it receives the guidance
17 parameters from 12. It creates the automatic pilot commands, which it sends
18 across 13 and then 9b takes that and turns that into the actuator commands.
19 Which are either sent right to the actuator, figure 1, or they're sent just past
20 through computer 3 in figure 2.

21 JUDGE BAHR: Mm hmm. But they're definitely...It seems to me
22 that paragraph definitely indicates that it was known in the art to use a first
23 computer, a navigation computer to generate automatic pilot instructions
24 from guidance parameters and guidance instructions and then to transmit
25 back to a control computer that converts those into control surface operating
26 instructions. And then the next paragraph though, and this is what confused

1 me, the next paragraph goes on and says further in discussing these known
2 embodiments in a case where “the automatic pilot instructions are
3 transmitted via the control computer. The flight control computer receives
4 from the automatic pilot the commands for operating the automatic pilot
5 which have already been fully produced and that in consequence its roll
6 amounts to simply transmitting the automatic control commands
7 unmodified.” That seems inconsistent with what’s being described in the
8 paragraph above. Where it looks like the control computer actually converts
9 the automatic pilot instructions into something else. More specifically
10 control commands for actuators for the control surfaces. So which is it?

11 EDWARD TRACY: That is consistent. In the first paragraph it’s
12 talking about computers 9a and 9b. 9a receives guidance instructions and
13 guidance parameters. 9b gets the automatic pilot instructions. And then in
14 figure 2 it sends the commands to 3 which is the flight control computer and
15 then the flight control computer is just passing them through unmodified.

16 JUDGE BAHR: Ok

17 EDWARD TRACY: So the control computer and the flight control
18 computer are different computers.

19 JUDGE BAHR: But for the purposes of the claim it seems to me they
20 could be the same.

21 EDWARD TRACY: Well, the discussion of, first of all I’d like to say
22 what’s done in the art is very different from what’s done in Pages. Again,
23 Pages is putting these commutators together. And thus the distinction over
24 these two background art figures is the dedicated link between the control
25 computer and the flight control computer. It’s shown in figure 3.

1 JUDGE BAHR: So you think that's the only distinction between the
2 admitted prior art and claim 1, the dedicated link?

3 EDWARD TRACY: Well also it deletes the computer 9b. It also
4 describes that the problem with the prior art, is that 9b...for example in
5 figure 1 the functionality of 9b is also in 3. And that causes redundant
6 processing and redundant, obviously testing and verification. So certainly
7 the one difference over figure 1 is to get rid of that computer and in effect 9b
8 is removed from both as you can see in figures...well figure three removes
9 9b, which is in both figures 1 and 2.

10 JUDGE BAHR: That's really got nothing to do with claim 1 does it?
11 Claim 1 doesn't exclude having another computer in there does it?

12 EDWARD TRACY: Well based on the functionality of each
13 computer that it describes. In figure 3, 9a is the navigation computer, which
14 receives the guidance instructions and guidance parameters. It transmits the
15 automatic pilot instructions to the flight control computer over the dedicated
16 link, 18. The control instructions and automatic pilot instructions are
17 received at the flight control computer, 3. Then in the automatic pilot mode
18 the flight control computer generates the operating commands based on the
19 automatic pilot instructions and in the manual pilot mode it generates the
20 operating commands based on the control instructions from the pilot.

21 JUDGE BAHR: Right.

22 EDWARD TRACY: So the functionality of 9b is now in 3. That the
23 generating of the operating commands is done by 3, and 9b is not there.

24
25 JUDGE BAHR: I understand that, but I'm not sure how that prior art
26 is distinguished from claim 1, other than the dedicated communication link.

1 EDWARD TRACY: Well in claim 1, the automatic pilot instructions
2 for the automatic pilot mode are generated by 9b not by...

3 JUDGE BAHR: Claim 1 says that?

4 EDWARD TRACY: No, the art does that. It describes the art

5 JUDGE BAHR: OK.

6 EDWARD TRACY: In the art that 9b is what generates the automatic
7 pilot instructions.

8 JUDGE BAHR: OK.

9 EDWARD TRACY: Well claim 1 says that the automatic pilot
10 instructions are transmitted to the navigation computer from the flight
11 control computer on a dedicated link. In the art you don't have the automatic
12 pilot instructions until you get to 9b. So for the navigation computer to
13 transmit the automatic pilot instructions to the flight control computer 9b
14 would have to send them back to 9a and then 9a would send them to 3. So
15 you're saying that that's not prevented by the claim, I mean...

16 JUDGE BAHR: I'm just looking at what that paragraph bridging
17 pages 1 and 2 says.

18 EDWARD TRACY: OK

19 JUDGE BAHR: I'm trying to find a distinction between that and
20 claim 1, other than the dedicated communication link or possibly that last
21 paragraph about "in an automatic pilot mode generating a first plurality of
22 operating commands in an..."

23 EDWARD TRACY: Well again, the control computer is 9b and does
24 not exist in the claimed invention. So the navigation computer receives
25 guidance instructions, this is from the top of page 2, and from these guidance

1 produces the automatic pilot instructions and then the control computer
2 converts the automatic pilot instructions into commands.

3 JUDGE BAHR: Right. That seems to me to be doing what the last
4 step here in generating a...

5 EDWARD TRACY: Right. The flight control computer is doing that.

6 JUDGE BAHR: Right. So what's called flight control computer in
7 claim 1 seems to be the control computer in the discussion of the prior art in
8 that paragraph.

9 EDWARD TRACY: Well the flight control computer also accepts the
10 commands from the pilot. And in the last element of claim 1 the flight
11 control computer does both; generates all the operating commands either
12 based on the automatic pilot instructions from the navigation computer or
13 based on the controller instructions from the flight control computer.

14 JUDGE BAHR: That's what the examiner brings in the second
15 reference in for right?

16 EDWARD TRACY: We...with the selection of one mode or the
17 other?

18 JUDGE BAHR: Right.

19 EDWARD TRACY: Right. I think in figure 1 and figure 2 had the
20 same mode. The difference is the redundant processing between 3 and 9b.

21 JUDGE BAHR: Why are you talking about figures 1 and 2? I'm
22 talking about the admitted prior art and the art that was relied on in claim 1.
23 I'm not talking about figure 1 and figure 2.

24 EDWARD TRACY: OK, Figures 1 and 2 is what's described on page
25 2.

1 JUDGE BAHR: Maybe, but that's not what's described... the
2 paragraph is a little broader.

3 EDWARD TRACY: I'm sorry.

4 JUDGE PATE: She said that the paragraph is broader than what's
5 shown in figures 1 and 2.

6 JUDGE BAHR: Figure 1 and 2 seem to be one embodiment or two
7 embodiments perhaps of what was known in the prior art, but it looks to me
8 like from that paragraph bridging pages one and two that it was known to do
9 these two separate calculations in two different computers.

10 EDWARD TRACY: Right, and in the middle of page two it describes
11 the redundancy problem of that, that you have to...

12 JUDGE BAHR: Well if there's a redundancy problem there, then
13 there's a redundancy problem in claim 1, because it doesn't seem to me that
14 there's anything more described in claim 1 with regard to the calculations
15 done by the two computers than is described in that paragraph bridging
16 pages one and two. Granted that may not talk about taking commands from
17 both the automatic pilot and from the controls from the airplane itself, but
18 I'm just getting at the calculations themselves, that there's two different
19 computers. One takes the guidance parameters, and from that calculates
20 automatic pilot instructions, and then transmits that to another computer,
21 which takes those instructions and from that generates control commands for
22 the operating surfaces.

23 EDWARD TRACY: In figures 1 and 2, and in the art that's described
24 on page 2, two different computers have the exact same processor. Two
25 different computers will take guidance commands and turn them into
26 automatic pilot instructions or guidance inputs and turn them into automatic

1 pilot instructions and then all merge into one computer, the flight control
2 computer in claim 1. In claim 1, the flight control computer gets both the
3 control instructions, which is from the pilot, and the automatic pilot
4 instructions, which is from the navigation computer, and takes one or the
5 other and turns those into the operating instructions. Where as in figures 1
6 and 2, those are done by two separate computers. So there's redundant
7 processing in that admitted art. And then in one of the distinctions of that
8 admitted art.

9 JUDGE BAHR: I'm not sure it's a claimed distinction but anyway,
10 why don't we move on.

11 JUDGE PATE: Fine.

12 EDWARD TRACY: OK, well in the last element it says the flight
13 control computer does both of those items. In automatic pilot mode
14 generating first priority operating commands based on automatic pilot
15 instructions at the flight control computer, and the manual pilot log
16 generates secondary priority updates on the control instructions of the flight
17 control computer. So the flight control computer does both of those
18 calculations.

19 JUDGE BAHR: I understand that.

20 JUDGE PATE: I think we're just agreeing to disagree here.

21 JUDGE BAHR: Yes.

22 JUDGE PATE: I don't think we're getting any further.

23 EDWARD TRACY: OK.

24 JUDGE PATE: Do you have any questions Judge Kerins?

25 JUDGE KERINS: I do not.

26 JUDGE PATE: You don't have any further questions?

- 1 JUDGE BAHR: NO
- 2 JUDGE PATE: We're going to take this case under advisement.
- 3 EDWARD TRACY: OK. Thank you.
- 4 JUDGE PATE: Thank you very much.
- 5 (Whereupon, at approximately 9:28 a.m., the proceedings were concluded.)